

The Impact of Pro-Vulnerable Income Transfers

Leisure, Dependency and a Distribution Hypothesis

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Abstract

This paper studies a transmission mechanism through which pro-vulnerable income transfers may affect individual decision-making of non-beneficiaries in an extreme poverty context, leading to labor supply contraction and the so-called dependency syndrome. The argument is based on the distributional distortion this transfer may provoke to the relative quality of leisure, enjoyed by the population in an extreme poverty scenario. Assuming the existence of vulnerable individuals

and different income groups based on certain physical, economic, or social characteristics, the author studies their decision processes and, in particular, their reactions to the aid program. The results of this theoretical research provide some insights on the conditions that an optimal pro-poor income transfer should present. A literature review is presented in support of the arguments made in the theoretical part.

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**The impact of pro-vulnerable income transfers:
Leisure, dependency and a distribution hypothesis.**

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Several papers have analyzed the microeconomic effects of income transfers targeted to vulnerable populations and, especially, conditional cash transfer (CCT) studies have become increasingly popular: Gaardner, Glassman and Todd (2010) unpack the causal chain between CCTs and health; Leroy, Ruel and Verhofstadt (2009) focus on CCTs and child nutrition; and Maluccio, Murphy and Regalia (2010) research the relations between the success of CCTs and initial supply conditions.

This paper, related to research in this field, studies one of the microeconomic conditions through which income transfers targeted to vulnerable people can reduce labor supply and spark a dependency syndrome.

The argument is based on a distributional effect of pro-vulnerable transfers. Assuming two groups defined in terms of income level, the beneficiaries of the program (vulnerable) and the non-beneficiaries (non-vulnerable): we study why a pro-vulnerable transfer to the beneficiary group (i.e., foreign aid, national poverty programs, CCT) may provoke a labor supply reduction among the non-beneficiaries. Assuming that the program is targeted to all vulnerable individuals, start from a traditional neoclassical labor-leisure model, in which the non-beneficiary group reacts to the introduction of the aid program, through a “relative reservation constrain” that may become binding. In this model for a given income transfer provided to vulnerable people, marginally richer individuals (non-targeted by the program) may react by dropping working hours and become involved in the program. For this reason, we introduce an additional “relative reservation” constraint, stating that the equilibrium utility level of the non-vulnerable group is higher or equal to that of the treated group.

Therefore, we interpret “aid dependency” as a social strategic interaction, rather than as emerging from an individual maximization problem. Because the two groups are specified in accordance with their income rather than utility, marginally richer individuals (non-beneficiaries) may obtain substantial disutility by working for long hours. Therefore, as pro-vulnerable transfers increase the beneficiary group’s income, it also increases the “relative reservation” utility level of the non-beneficiary, and this may affect their utility maximization and lower the non-beneficiary labor supply, sparking dependency.

Several researches tend to be rather skeptical of the claim that an income boost (produced by income transfers or foreign aid) can produce an increase in the demand for leisure, so-called “dependency syndrome”. In this paper, we do not reject this claim, but argue that marginally richer individuals (non-beneficiary of aid programs) may introduce strategic behaviors (i.e., reduce working hours) in order to qualify as vulnerable and join the program. For this reason the distributional dimension may help disentangling this phenomenon and enrich the individual maximization problem.

One of the central papers in this field by Kanbur, Keen and Tuomala (1994) introduced “labour supply considerations into the targeting of poverty alleviation programs in developing countries”,

and shows that “indicator targeting rules may also have to be modified significantly when labour supply responses are recognised”. Chatterjee and Turnovsky (2006) analyze the case in which labor supply is elastic to aid transfers, through a remarkable theoretical and numerical simulation, and find that while tied aid boosts employment time, productivity and economic growth; a pure income transfer (like the one that will be analyzed) causes the opposite effects. Similar results are found by Gong and Zou (2001): in their optimal growth model with foreign aid and endogenous leisure-and-consumption choices, they conclude that a “rise in foreign aid reduces long-run capital accumulation and labour supply”.

The paper is structured as follows: the next two sections present a theoretical view of this phenomenon and develop it, the third section reviews some case studies and the literature that analyzes the impact of income transfers on labor supply, and the fourth section reports some concluding remarks.

1. Theory

Targeted income transfers respond effectively to two broad problems: how to support the vulnerable and how to use limited resources for a broad problem. Two types of targeting can be broadly identified (Van de Walle 1998): “broad targeting” which aims to channel public spending in a certain sector and “narrow targeting” which directly refers to certain categories of people, generally the poor. In this work, we study the effect of a narrow-targeted, pro-vulnerable, income transfer program.

This may be introduced for different reasons (i.e., humanitarian crisis, development project...) and through different types, for example foreign aid or national poverty-reduction programs. However we start from the assumption that this does not affect the local economy in a variety of ways: relative prices, as well as human, land or physical capital, do not change as a result of this change.

It is important to state that in this paper we will not analyze the dependency led by distortions in agricultural prices, as there is an abundant and exhaustive literature with this regards. For example Isenman and Singer (1977) present a review of the transmission mechanisms through which food aid affects welfare and labor supply in low-income countries, based on agricultural price distortion.

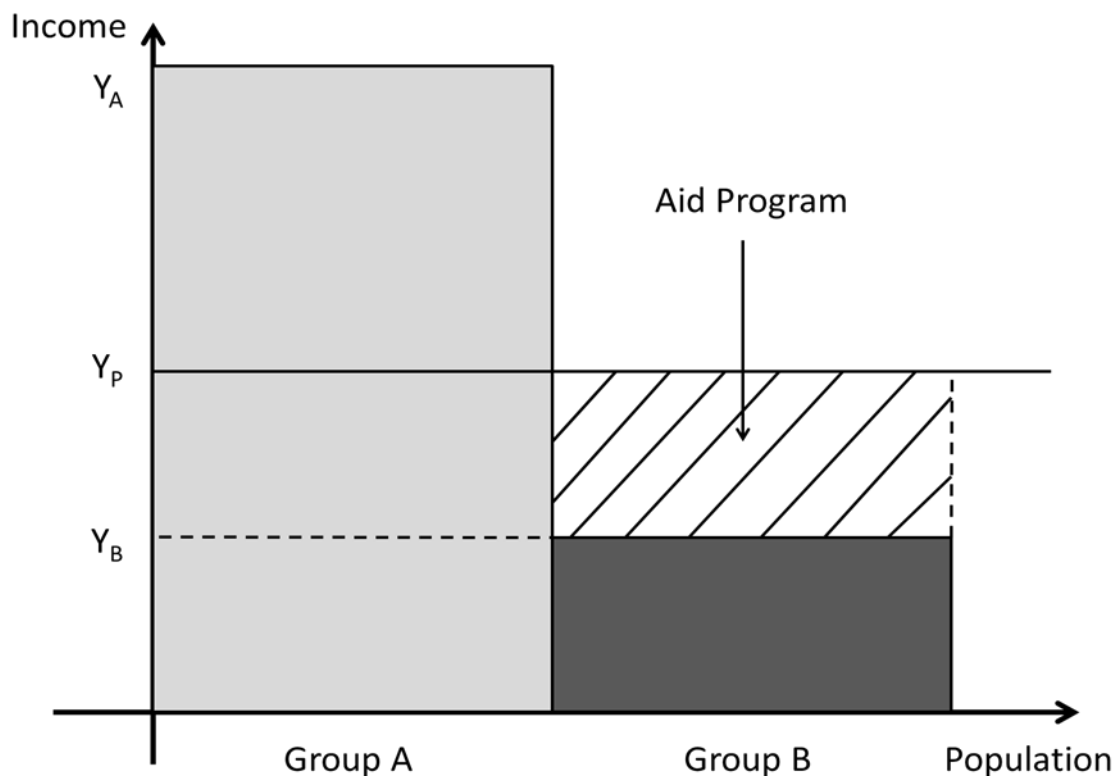
In this simple model, we analyze a small villageⁱ in a context of extreme poverty, with a given population (Pop). For the sake of simplicity, this population is composed of two equally-numbered groups, A (non-treated) and B (treated by the pro-vulnerable income transfer program), so that $Pop=A+B$. Among these groups there are no intra group differences (Y_B represents the same income for all the vulnerable, similarly Y_A for all the non-treated). From the traditional relation between income (Y), wage rate (w) and working hours (L) follows:

$$Y_x = w L_x \text{ with } X = A, B$$

(1)

Therefore, given a certain wage per hour equal across the two groupsⁱⁱ, w , the income earned by each group depends exclusively on the amount of working hours, L_X . Before the aid program, the vulnerable group (B) earns less than the non-vulnerable group (A), because they work less, so that $Y_A > Y_B$ because $L_A > L_B$. The reasons behind this can be several: economic factors (i.e., land ownership, capital equipment...) may expose vulnerable individuals to a higher poverty risk because of their initial conditions, health reasons (ie. mutilations, diseases...) may physically constrain their working hours, or social conditions (ie. tribal, cast, class...) may force vulnerable individuals to less rewarding jobs.

Assume that this village is involved in a pro-vulnerable income transfer program (which will be called for simplicity aid program) brought forward by a certain domestic or international organization. This program intends to provide the most vulnerable individuals (B group in this model) with some income in order to reach the poverty line (in whichever parameter it is defined). This model does not define the amount of aid as a direct (monetary) or indirect (in-kind) transfer, because given extreme poverty, people can be assumed to spend all of their income in food, water and minimal healthcare.ⁱⁱⁱ Hence, perfect equality between income and consumption is assumed in this model.^{iv}



- Figure 1 -

On the vertical axis there is daily income per worker, while on the horizontal axis there is population. As previously stated, the population is divided in two groups (named A and B and sized $A=B=Pop/2$), assumed to earn a certain equal income within them. Therefore, the representative group A agent earns a daily income Y_A , is not vulnerable and thus not treated: its condition is shown in the first column; correspondingly, group B earns Y_B and represents vulnerable people targeted by the program and is represented in the second column. Y_P refers to the poverty line.

Between the two groups, only group B will be eligible for the program, because in group A individuals earn enough to pass the poverty line and be excluded. A fundamental assumption behind the model is the perfect information enjoyed by the aid agency, that is able to discern A from B agents and capable of intervening only on the latest. In fact, if imperfect information was assumed then it would be trivial to argue the relation between needless individuals receiving aid and their labor supply reduction. In this work we show that even in presence of perfect treatment selection, the interactions between different groups can result in more dependency.

Therefore the income situation may be sketched in Figure 1.

As shown in Figure 1, group B individuals earn Y_B , below the Poverty Line daily income Y_P , and the aid program aims to elevate the living standards of these people by financing the gap between Y_P and Y_B for B people, corresponding to the shaded area. From this representation an expected result emerges.

Proposition 1

A pro-vulnerable income transfer instantaneously promotes a higher aggregate income in the village.

Proof

The total income received by the entire population, before the aid program, was

$$Y_{POP0} = Y_{A0} A + Y_{B0} B = w (L_A A + L_B B)$$

where Y_{POP0} is the sum of each group's total income, at time 0 before the foreign agency plan. It will be the sum of the two groups' total working hours multiplied by the hourly wage. The situation changes in period 1 as it follows:

$$Y_{POP1} = Y_{A0} A + Y_{B1} B = Y_{A0} A + Y_{B0} B + (Y_P - Y_B) B$$

$$Y_{POP1} = w (L_A A + L_B B) + \psi B$$

The new aggregate income is Y_{POP1} is higher than Y_{POP0} because of the higher income B group receives at time 1 in comparison with time 0, Y_{B1} . This new income incorporates the foreign aid coming into the community ($\psi = Y_P - wL_B$). Therefore an obvious proposition follows: foreign aid generates an instantaneous aggregate income growth.

2. The Model

Given this first well expected effect, this analysis parses the outcome of this foreign income injection onto group A and analyzes the reactions of marginally richer individuals to the program. We will study why group A individuals may give up their extra-work, join the aid safety net and “use aid to buy more leisure.”^v

The fact that the two groups present different working hours (with $L_A > L_B$) is caused by the impossibility for B group to freely allocate their time between labor (L) and leisure (R), like A. Indeed, group A and B are composed of individuals identical in their preferences, utility function (it will follow that $U_A = U_B = U$) and their sole difference lies in the utility maximization, that in the case of B group is undertaken because of natural/social constraints.

Therefore, if a utility function is introduced, such as

$$U_X = U_X(C, R) = U_X(Y, R) \text{ with } X = A, B$$

$$\frac{\partial U}{\partial Y} > 0 \text{ and } \frac{\partial U}{\partial R} > 0$$

$$Y = C$$

$$D = L_X + R_X$$

(2)

we can see that the utility function (U_X) is composed of two arguments, income (Y) and leisure (R) and that both positively affect utility. The last two expressions represent: a “natural condition”, (2), implying that the individual time of a day (D) is split between work (L) and leisure (R) and that, as previously presented, income and consumption are assumed to be equal. While A group is free to allocate their time between L and R, B is not.

Group B holds a constraint in their working hours for a series of different reasons (diseases, relatively smaller fields, social norms...), that generates a difference in their maximization process. Therefore their maximization can be expressed through:

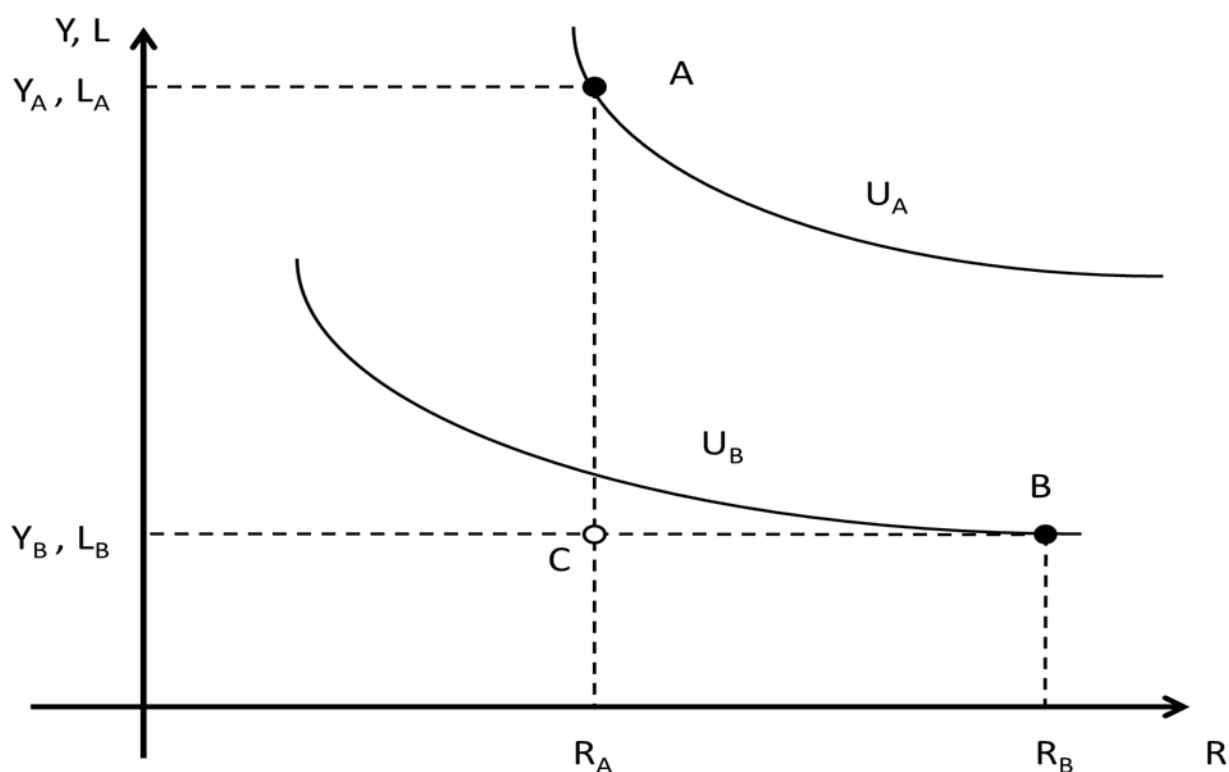
$$\max U_B = U_B(Y, \bar{R}_B)$$

$$\text{subject to } Y = wD - w\bar{R}_B$$

$$L_B = U_B(Y, R) - \lambda(Y - wD + w\bar{R}_B)$$

$$MSR_{YR} = -\frac{dY}{dR} = w$$

the impossibility to work more than \bar{L}_B or, as imposed into the budget constrain, the impossibility to rest less than \bar{R}_B , does not allow them to choose any better alternative allocation than (\bar{L}_B, \bar{R}_B) and thus generates an income \bar{Y}_B . Differently group A undertakes a typical unconstrained maximization and Figure 2 shows a possible result generated by this difference.



- Figure 2 -

On the vertical axis there is daily income per worker and working hours, while on the horizontal axis there are leisure hours. We can see that the position A, which represent the maximization for A people is Pareto-preferred to B, because it is on a higher utility curve.

From Figure 2 it is clear that the A group enjoys a higher utility than B, except the case in which A and B decisions coincide and thus their utility is equal. Therefore we can see that before any aid program there is an implicit condition on the relative utility between group A and group B, stating that marginally richer individuals enjoy a utility level higher or equal than vulnerable individuals. This condition emerges naturally from the fact that vulnerable individuals hold a certain constraint.

2.1 The aid program

The introduction of pro-vulnerable income transfers may subvert the condition stating that marginally richer individuals enjoy a higher or equal utility than vulnerable ones. Because transfers affect the income of the vulnerable without affecting their equilibrium labor-leisure position^{vi}, marginally richer (non-beneficiary) individuals may lose the “advantage of unconstrained optimization”. In fact, it may be possible that given the disutility of working longer hours (as the position A in Figure 2 implies), non-beneficiary individuals may decide to decrease their labor supply in order to join the aid safety net. In this case the emergence of dependency is due to an explicit constraint emerging in the non- beneficiary (group B) maximization, which we define “minimum leisure” condition (or MILE condition).

In order to describe the MILE condition, it is useful to define an intuitive measure of “leisure quality”. As described in Figure 1, it is known that $Y_A > Y_P > Y_B$, given Y_P as the poverty line daily income. Holding the quantity of leisure constant across people, a marginally richer individual enjoys a higher income-intensive leisure and therefore a higher quality of leisure relatively to lower-income individuals. In this model, such measure will be introduced through this simple index:

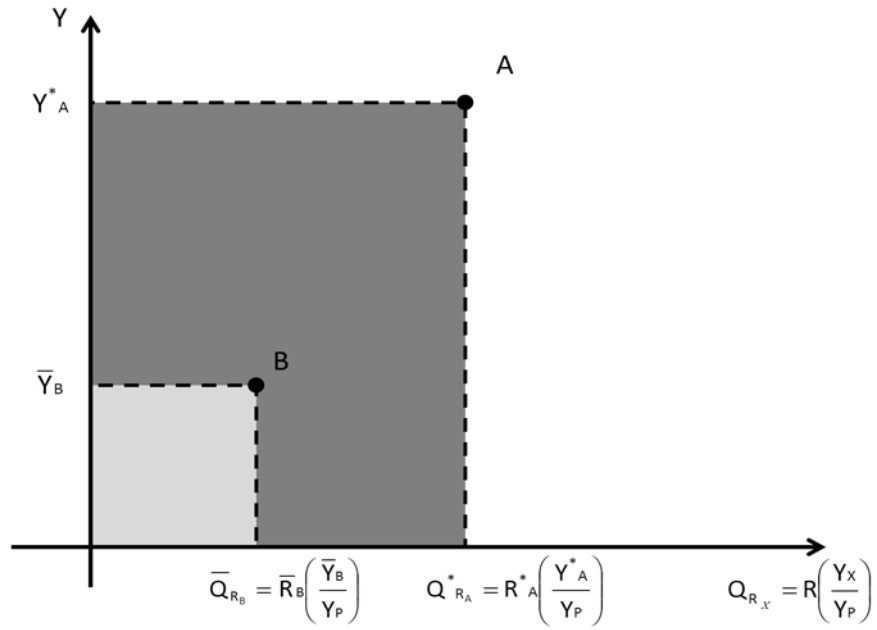
$$Q_{RX} = R_X \left(\frac{Y_X}{Y_P} \right) \text{ with } X = A, B \quad (3)$$

where (3) reports a measure of the quality and quantity of leisure enjoyed by people, which will be called leisure quality units. It is specified as a multiplication between the net hours of leisure enjoyed by a person X (R_X - quantitative component) and a ratio between the current income of that person relatively to the poverty line^{vii} ($\frac{Y_X}{Y_P}$ - qualitative component). In this simple model, in which the focus of our analysis is an extreme poverty context, it might be sensitive to assume this Q_{RX} to be simply linear, as it should roughly represent a rule evaluating the quality of the single units (hours) of leisure enjoyed by people. Q_{RX} implies that the lower is the income earned by the individual relatively to the poverty line income, the worse its leisure time is, to the point that

$$\lim_{Y_X \rightarrow 0} Q_{RX} = R_X \left(\frac{Y_X}{Y_P} \right) = 0$$

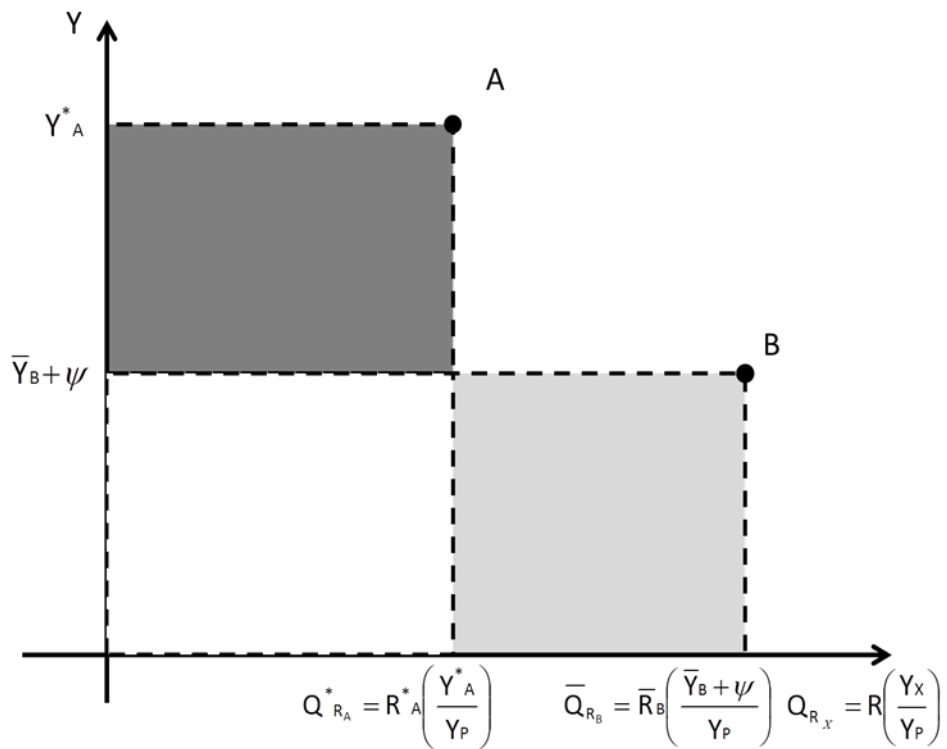
as income tends to zero, the leisure quality units go to zero as well.

In order to depict graphically this concept, it is sufficient to report a figure presenting income and leisure quality units before and after the aid program, in order to understand the emergence of the minimum leisure (MILE) condition. For notational simplicity we define $\psi = Y_P - Y_B$ as the amount of the aid program.



- Figure 3 -

On the vertical axis there is daily income per worker, while on the horizontal axis there are the leisure quality units Q_{RX} . This graph reports the equilibrium positions before the aid program for both the vulnerable individuals (group B) and the marginally richer ones (group A).



- Figure 4 -

On the vertical axis there is daily income per worker, while on the horizontal axis there are the leisure quality units Q_{RX} . This graph reports the equilibrium positions after the aid program, expressed with $\psi = Y_P - Y_B$, for both the vulnerable individuals (group B) and the marginally richer ones (group A).

Figure 3 shows that, before the aid program, marginally richer (A) individuals were enjoying a better position than vulnerable ones (B). However as Figure 4 reports, there may be cases in which the aid program may provoke a preference switch, so that being treated by the program (vulnerable) is more convenient than being untreated.

Given this explanation, we can make explicit the minimum leisure condition that marginally richer individuals internalize in their utility maximization. Such an MILE condition can be expressed as

$$Q_{RA} \geq \bar{Q}_{RB} \rightarrow R_A \left(\frac{Y_A}{Y_P} \right) \geq \bar{R}_B \left(\frac{\bar{Y}_B}{Y_P} \right)$$

$$R_A \geq \bar{R}_B \left(\frac{\bar{Y}_B}{Y_A} \right)$$
(4)

Therefore, as (4) reports, the utility of marginally richer (A) individuals will be higher than that of B (vulnerable) individuals, if and only if R_A will be higher than \bar{R}_B multiplied by a term expressing the income gap between the two groups. The economic sense is simple, a person will work more if this incremental income guarantees higher living conditions (a higher quality of its leisure in this case), taking into account also the disutility from longer work.

When the pro-vulnerable income transfer program is introduced, the income received by vulnerable individuals grow and this affects the condition as follows

$$R_A \geq \bar{R}_B \left(\frac{\bar{Y}_B + \psi}{Y_A} \right)$$

Recalling the relations reported in (1) and (2), we may rewrite this condition as follows

$$R_A \geq \bar{R}_B \left(\frac{w\bar{L}_B + \psi}{wL_A} \right)$$

$$R_A \geq \bar{R}_B \left(\frac{wD - w\bar{R}_B + \psi}{wD - wR_A} \right)$$

dividing both terms for D and w , it leads to the final minimum leisure (MILE) condition:

$$R_A \geq \bar{R}_B \left(\frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{1 - \frac{R_A}{D}} \right)$$
(5)

(5) explicitly incorporates a constrain on the relative quality of leisure between vulnerable (A) and marginally richer (B) individuals.

At this point, we may focus on the maximization of group A after the pro-vulnerable income transfer program, including the MILE condition. It is important to highlight that we assume that given a certain wage rate w and a given constraint on vulnerable individuals (\bar{R}_B), the aid program (ψ) does not alter the maximization of group B individuals. Therefore the optimal constrained labor-leisure position for vulnerable individuals (\bar{L}_B, \bar{R}_B) is the same in presence or absence of aid programs and this is taken as a given condition in the maximization of marginally richer individuals, expressed through the MILE condition.

2. A Relatively Constrained Maximization

In this section we develop analytically the utility maximization for marginally richer individuals in a context of extreme poverty (the A group discussed in the paper), assuming that the decisions of B people are taken as a priori determined. The MILE condition is the second constrain and reports \bar{R}_B as the predetermined quantity of leisure hours decided by group B individuals.

It is important to clarify that the nature of these variables (all of them strictly positive), significantly simplifies the maximization process and the application of Kuhn-Tucker conditions.

$$\begin{aligned} \max U_A &= U_A(Y, R) \\ \text{subject to } Y - wD + wR &= 0 \\ \bar{R}_B D \left(\frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{D - R} \right) - R &\leq 0 \\ \text{where } Y \geq 0 \quad R \geq 0 \\ \text{and } w \geq 0 \quad D \geq 0 \quad \bar{R}_B \geq 0 \end{aligned}$$

We can write the Lagrangian function

$$L = U_A(Y, R) - \lambda_1(Y - wD + wR) - \lambda_2 \left[\bar{R}_B D \left(\frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{D - R} \right) - R \right]$$

on which Kuhn-Tucker's conditions are applied

$$1. \quad \frac{\partial L}{\partial Y} = \frac{d U_A}{d Y} - \lambda_1 \leq 0$$

$$2. \quad \frac{\partial L}{\partial R} = \frac{d U_A}{d R} - \lambda_1 w + \lambda_2 + \lambda_2 \bar{R}_B D \frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{(D - R)^2} \leq 0$$

$$3. \quad Y - wD + wR = 0$$

$$4. \quad \bar{R}_B D \left(\frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{D - R} \right) - R \leq 0$$

given that $Y \geq 0$ and $R \geq 0$, then 1 and 2 hold with equalities and therefore

$$1. \quad \lambda_1 = \frac{d U_A}{d Y}$$

$$2. \quad \frac{d U_A}{d R} - \lambda_1 w + \lambda_2 + \lambda_2 \bar{R}_B D \frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{(D - R)^2} = 0$$

from 1 we conclude that $\lambda_1 > 0$, by assumption on the utility function concavity. Focusing on 2., we can see that

$$\begin{aligned} \frac{d U_A}{d R} - \frac{d U_A}{d Y} w + \lambda_2 \left[1 + \bar{R}_B D \frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{(D - R)^2} \right] &= 0 \\ \frac{d U_A}{d R} - \frac{d U_A}{d Y} w + \lambda_2 \left[\frac{(D - R)^2 + \bar{R}_B D \left(1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD} \right)}{(D - R)^2} \right] &= 0 \\ \lambda_2 = \left(\frac{d U_A}{d Y} w - \frac{d U_A}{d R} \right) \left[\frac{(D - R)^2}{(D - R)^2 + \bar{R}_B D \left(1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD} \right)} \right] \end{aligned}$$

Therefore the term λ_2 is higher than zero if two conditions hold, the first is implied by

$$\begin{aligned} \frac{d U_A}{d Y} w - \frac{d U_A}{d R} &\geq 0 \\ w &\geq \frac{d Y}{d R} \quad (\text{always verified}) \end{aligned}$$

(6)

and given that work and leisure are both normal goods with a positive marginal utility and that more income is implied by more work and less leisure, the expression $\frac{d Y}{d R}$ is negative and given the hypothesis on w , we proved that (6) is always verified.

The second depends on the following inequality

$$\frac{(D - R)^2}{(D - R)^2 + \bar{R}_B D \left(1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD} \right)} \geq 0$$

which implies that

$$(D - R)^2 \geq 0 \quad (\text{always verified})$$

and that

$$(D - R)^2 + \bar{R}_B D \left(1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD} \right) \geq 0$$

$$(D - R)^2 + \bar{R}_B \left(D - \bar{R}_B + \frac{\psi}{w} \right) \geq 0$$

$$(D - R)^2 + \bar{R}_B \left(\bar{L}_B + \frac{\psi}{w} \right) \geq 0 \quad (\text{always verified})$$

(7)

Given that $(D - R)^2 > 0$, $\bar{R}_B > 0$, $\bar{L}_B > 0$, $w > 0$ and $\psi \geq 0$, condition (7) is verified and therefore we conclude that $\lambda_2 > 0$.

Regarding the forth condition in the maximization process, we know that

$$\bar{R}_B D \left(\frac{1 - \frac{\bar{R}_B}{D} + \frac{\psi}{wD}}{D - R} \right) - R \leq 0$$

Given that $R, D - R, \bar{R}_B, D - \bar{R}_B$ are all positive by definition, this is

$$R \geq \bar{R}_B \left(\frac{D - \bar{R}_B + \frac{\psi}{w}}{D - R} \right)$$

Condition 4 is always verified when there is no aid transfer to vulnerable individuals, $\psi = 0$, in fact

$$\frac{R}{\bar{R}_B} \geq \frac{\bar{L}_B}{L} \quad (\text{always verified})$$

This condition is always true given the assumption that vulnerable individuals hold a constrain on their resting hours such that $\bar{R}_B \geq R_A$ and as a result $\bar{L}_B \leq L_A$. Therefore the left-side of this condition is always higher than one, while the right-side is always lower than one; except the case in which marginally richer individuals choose to work as much as vulnerable individuals for exogenous reasons (implied by w or their utility function characteristics) and thus this condition is verified with an equality.

However when some income is distributed to vulnerable individuals, $\psi > 0$, then condition 4 is verified only for given values of the pro-vulnerable income transfer, ψ , in fact

$$\frac{R}{\bar{R}_B} \geq \left(\frac{D - \bar{R}_B + \frac{\psi}{w}}{D - R} \right)$$

$$\frac{\psi}{w} \leq \frac{R}{\bar{R}_B} \cdot (D - R) - (D - \bar{R}_B)$$

$$\frac{\psi}{w} \leq \frac{R}{\bar{R}_B} \cdot L - \bar{L}_B$$

This leads to the final condition on income transfer

$$\psi \leq \frac{R}{\bar{R}_B} \cdot Y - \bar{Y}_B$$

and because it is feasible to believe that marginally richer individuals are not neutral between hard-work and joining the aid program, we define this condition only as a strict inequality

$$\psi < \frac{R}{\bar{R}_B} \cdot Y - \bar{Y}_B.$$

(8)

Condition (8) is extremely important and represents the core of this paper. In fact, within the assumptions of this model, it reports the optimal conditions under which the program of pro-vulnerable income transfers should be set. The optimal aid transfer is positively dependent on the leisure relative weigh, $\frac{R}{\bar{R}_B}$, so that the larger the leisure gap between non-beneficiaries and the vulnerable, the higher the income transfer can be. It is also positively related with the income of marginally richer individuals: the higher is their income (group A) and the higher the optimal transfer can be. Finally, it negatively depends on the vulnerable individuals' income, \bar{Y}_B , the higher group B income is, the lower the transfer needs to be.

This condition is consistent with a number of critics: if the income difference between the two groups is very high, then inter-group externality caused by the aid program is possibly not relevant. Secondly, in a multi-income group village it is sensitive to think that only those individuals who are “marginally” beyond the poverty line (in whichever way defined by the program), react to the program by dropping their labor supply. Recalling (8) and the definition of the pro-vulnerable transfer, $\psi = Y_P - \bar{Y}_B$, we can give a condition on which individuals in the village are affected by the program.

$$Y_P - \bar{Y}_B < \frac{R}{\bar{R}_B} \cdot Y - \bar{Y}_B$$

$$Y_P < \frac{R}{\bar{R}_B} \cdot Y$$

$$Y > Y_p \cdot \frac{\bar{R}_B}{R}$$

(9)

Condition (9) states that all individuals presenting an income higher than the poverty line, multiplied by their leisure gap with vulnerable individuals, are not affected in their labor-leisure decisions by the aid program. While for all individuals whose income is equal or lower than the left-hand side of (9), the MILE condition becomes relevant and endogenous to their labor-leisure preferences.

2.1 Targeting and policy implications

It is very important to highlight that the fundamental argument of this paper lies in demonstrating that pro-vulnerable transfers in an extreme poverty context may result in dependency, because non-beneficiaries may adopt strategic behaviors that result in dependency.

In a sense, the results of this paper may flow in the vast literature on aid targeting, suggesting that income distribution and the quality of leisure may matter as well. However, the point that we would like to stress is the importance not only to levels (income, land ownership, capital equipment...) but especially to distributions. In fact, in this paper we introduced rigid assumptions that avoided the emergence of dependency led by labor supply contraction of vulnerable individuals. Conversely, the “marginally richer” individuals make the difference and might be among the causes of failure for some aid programs.

We defined vulnerability in terms of income and presented it through economic factors (i.e. land ownership, capital equipment...), health reasons (i.e. mutilations, diseases...) or social conditions (i.e. tribal, cast, class...). It might be correctly stated that the policy implications of this work lead to prefer the targeting of economic/health/social indicators, rather than income. However we are aware that targeting should not be treated in a simplistic way. Besley and Kanbur (1993) show that several kinds of cost make targeting expensive and difficult: administration and data collection, incentive effects or behavioral responses, and costs that result from the consequences of political economy.

As Besley and Kanbur state the “ideal solution” lies somewhere between perfect targeting and a universal approach, while Van De Walle (1998) argues that narrow targeting programs (i.e., the one analyzed in this paper) is not necessarily preferable to broad targeting interventions (i.e., targeting spending sectors). All in all, targeting should not be considered a panacea and for this reason, given the theoretical contribution of this paper, we hope to provide some stimuli to the literature on targeting and leave this discussion for further research.

3. A Review of the Empirical Literature on Aid and Dependency

The aim of this section is to look at the evidence that may indicate that aid programs can exert some distributional distortions that lead to changes in the labor supply. This is done for two reasons, firstly to show that there is a controversial debate on whether production unrelated cash flows (like pro-vulnerable income transfers, aid or remittances) tend to alter both individual and social decision making, and secondly in order to encourage more empirical research in verifying the theoretical statement developed in this piece of research.

The empirical literature studying the distortions generated by aid is definitely wide. The approaches to reporting this phenomenon are of three types: anecdotal, numerical and empirical. The former reports mainly case studies and views expressed in reports or media: they may be heavily influenced by the reporters' opinion, though in most cases this represents the most powerful informative tool we can dispose of. The numerical one generally calibrates a model (i.e. computer general equilibrium) with parameters coming from some econometric estimation: it can provide relevant insights, but often leads to results largely dependent on the model's assumption and analyzed transmission channels. The empirical one, developed through the house-hold survey data analysis can be very powerful, especially if it presents a credible identification strategy.

In support of the distribution distortion channel developed in this paper, some controversial pieces of evidence can be reported. For example, a report by Groupe URD (2005) on Afghanistan, states that some communities did modify their collective behaviors upon receiving external assistance (rising unemployment, public good maintenance suspension). The case of Northern Kenya in 2006 is also explicative: Thilo Thielke (2006) reported in *Der Spiegel* that after a drought European food aid almost replaced the regional agricultural activity and that in the town of Loiyangalani and surrounding province more than 20,000 people were fed everyday free of charge over a population of roughly 40,000. Niger in 2005 is another case, as the New York Times article stated in "Niger, Hungry Are Fed, but Farmers May Starve" (Burley 2005), the displacement of farmers and the unbalanced disincentives toward seeking free food, rather than working, badly affected Niger, so far that the President Tandja deeply criticized UN aid agencies. Somalia and the establishment of its refugee camps were another controversial case in the 1980s, that may exemplify a dependency transmission channel like the one previously reported. For example, Tucker (1982), a former refugee assistance worker in a Somali camp, reported some statements that anecdotally match the ideas developed in this paper

"men no longer want to return to the tenuous existence of the nomad or dryland farmer, living constantly on the razor's edge of survival. Whereas they once collected their drinking water from the muddy river, they have now become accustomed to the fresh, clear water provided by diesel pumps and water tankers. Meanwhile their children grow up in the culture of dependency and learn no other way of life".

On the same subject, but through a rigorous analysis, Farzin (1991) concludes that “Somalia still depends heavily on imported food, and especially food aid, as a result of donor continuation of ill-planned food aid programs”. In fact, Farzin concludes that the insufficient aid organization, combined with a disequilibrium between food aid assistance and little farmer support produced a vicious circle that imprisoned Somalia in a growing dependency. For Cote d’Ivoire, an analysis involving different aid types and savings, Ouattara (2007) finds that “aid tends to worsen Cote d’Ivoire’s dependence”.

Ethiopia is a pretty well researched country, for which we would like to report four studies. The first is an anecdotal report by Salisbury (1992), narrating that Ethiopians remarkably altered their behavior (giving up their work, planting trees upside down), in order to secure the extension of the international food aid programs. These behaviors are totally consistent with our hypothesis and represent a form of “community moral hazard”. The second comes from an interesting household-survey study on food aid targeting in Ethiopia, (Clay et al 1999) which reports that there is “no significant association between household food availability (need) and food aid receipts” and recognize that “research is also needed to examine the potential disincentive effects that observed targeting errors may exert”. Another household survey research always on Ethiopia (Jayne et al : 2002) concludes that “the single most important determinant of whether a wereda (county) receives free food or food for work is whether that wereda has been a recipient in previous years. On its face, it is unclear whether historical use should be interpreted as indicating that inertia is determining allocations”. These two conclusions may be consistent with the result implying that in presence of badly targeted aid programs, needless people may react by joining the safety net and dropping work hours, so that it is unsurprising to find that needless individuals receive aid transfers. The last, which somehow, concludes on this case was prepared by Abdulai et al. (2004) stating that “the disincentive effects of food aid on household behaviours are many, large in magnitude and statistically significant. However, when we take into account household characteristics such as age, sex and education of head, land holdings, size and location, many of these adverse effects vanish”.

Sri Lanka’s targeted food stamp program presents a notable example supporting the hypothesis behind this work. In order to replace an old general food subsidy, a pro-poor food stamp program was introduced and, as Sahn and Alderman (1995) discovered, there was a significant and strong reduction in the number of working hours by targeted individuals in order to maintain themselves in the program.

Though the literature in this field is progressively growing, there is still too little stress on rigorously identifying the impacts of aid programs, especially income transfer programs, on key variables like labor supply, private insurance, savings, accumulation and their relation with income distribution. As this model shows, a significant cause of dependency may lie in the decision making of those individuals whom are not treated by the program, but find convenient to join the program by dropping their labor supply. Clearly, because at the moment we do not dispose of

useful data sources, this assumption cannot be empirically verified; however we believe that this work may encourage further research in this field.

4. Conclusions

This paper adds to a large literature on the impact of income transfers and dependency, proposing a transmission mechanism based on distributive aspects. The core of our explanation is based on the alteration of the minimal leisure (MILE) condition, that may lead to changes in the decision making of those individuals who are not originally targeted, but may find convenient to alter their decisions and join the program (dropping work hours).

The theoretical results of this paper argue that even when a project enjoys perfect information and manages to well distinguish between who needs help, there may be some unexpected distributional distortions leading to altering social dynamics and creating dependency.

The empirical literature on this topic is controversial. There is a solid body of anecdotal evidence supporting the “dependency syndrome” generated by social dynamics which are consistent with our explanation. However the empirical literature is still affected by paucity and the body of empirical papers analyzing aid projects’ impact on labor supply and income distribution, especially in low-income countries and extreme poverty scenarios, is not sufficient to define a consensus of the discipline. We would like to add our voice to that of authors who have asked for more research on this field in the hope that it would encourage posing the fundamental questions that are at the center of the development research agenda.

ENDNOTES

ⁱ The assumption behind the village size is introduced in order to avoid, in the simplest case, or minimize general equilibrium effects.

ⁱⁱ The assumption on hour wage equality may be sensible considering a context of very poor communities, in which the marginal productivity is generally low and the working hours may make the income difference.

ⁱⁱⁱ With this assumption we do not intend to deny the importance of the research on the effects of in-kind versus cash aid, there is a large and important literature studying these phenomena for example Basu (1996) and Faminow (1995) for a review of this subject. With this assumption we only intend to reduce the degree of complexity and offer a simple analytical framework for studying the distributional impact of aid on microeconomic behaviors.

^{iv} This hypothesis may be realistic for very low income levels (like the village under analysis), in which people's incomes range around the poverty line but do not exceed it by a significant degree.

^v Please refer to Andersen, Christensen and Tejerina (2005).

^{vi} If the aid program affected vulnerable individuals labor-leisure decision (which given these assumptions can only result in an increase in leisure hours), this would fall within the typical individually-explained dependency theory which is heavily debated in the literature.

^{vii} The qualitative term $\frac{Y_X}{Y_P}$ simply weighs the person's income relatively to the poverty income. Y_P was chosen as term because “defines the poverty line by finding the consumption expenditures or income level at which a person’s typical food energy intake is just sufficient to meet a predetermined food energy requirement”, please refer to Ravallion (1992) and to the World Bank Poverty Analysis page World Bank Page on Poverty Lines. Hence a person who earns less than it ($\bar{Y}_B < Y_P$) is likely not to “enjoy” this time and simply suffers for longer, or economically speaking enjoying a low quality of leisure, or less leisure quality units. Clearly the weigh $\frac{Y_X}{Y_P}$ will be lower than one if the individual income does not reach the poverty line and be higher than one if it exceeds this indicator. In this way the quality leisure unit measure becomes also an indicator of the individual welfare.

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